Access DB# 177084

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Tamra Dicus Examiner #: 79110 Date: 1-20-06
Art Unit: 1774 Phone Number 38 2-1519 Serial Number: 10/626,472
Mail Box and Bldg/Room Location: 10D20 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please see attached.

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PTO-1590 (8-01)

We claim:

1. A patterned polymer microgel, comprising a polymer film and a substrate on which said polymer film is supported, said polymer film including a superficial pattern having details in the submicron range and a non-patterned portion outside of said superficial pattern, said superficial pattern being distinguished from said non-patterned portion by a distinguishing property.

2. The patterned polymer microgel of Claim 1, wherein said substrate has an exposed area which does not support the polymer film, said superficial pattern being distinguished from said exposed area by said distinguishing property.

3. The patterned polymer microgel of Claim 1, wherein said superficial pattern is irregularly arranged.

4. The patterned polymer microgel of Claim 1, wherein said distinguishing property has an arbitrary distribution within said superficial pattern.

5. The patterned polymer microgel of Claim 1, wherein said polymer is a homopolymer.

6. The patterned polymer microgel of Claim 1, wherein said polymer is a copolymer.

7. The patterned polymer microgel of Claim 1, wherein said polymer film is a multilayer film comprising layers of at least a first polymer and a second polymer, said layers adhering to each other by a bonding mechanism selected from the group consisting of hydrogen bonding, electrostatic bonding and a combination of hydrogen bonding and electrostatic bonding.

8. The patterned polymer microgel of Claim 1, said distinguishing property being the degree of cross-linking of said polymer.

9. The patterned polymer microgel of Claim 1, said distinguishing property being the degree of swelling of said polymer when said polymer film is exposed to a solvent.

10. The patterned polymer microgel of Claim 1, said distinguishing property being the affinity of said polymer for adsorption of a protein.

11. The patterned polymer microgel of Claim 10, further comprising a protein adsorbed to said film within said superficial pattern.

12. The patterned polymer microgel of Claim 1, said distinguishing property being the affinity of said polymer for adhesion of a cell.

13. The patterned polymer microgel of Claim 12, further comprising a cell adhered to said film within said superficial pattern.

14. The patterned polymer microgel of Claim 1, further comprising a bioactive molecule reversibly bonded to said layer within said superficial pattern.

15. The patterned polymer microgel of Claim 1, wherein said superficial pattern comprises a pH-sensitive microgel.

16. The patterned polymer microgel of Claim 1, further comprising an inorganic substrate, said layer being chemically bonded to said inorganic substrate.

17. A method of making a patterned polymer microgel, comprising the steps of:

forming a dry polymer film on a substrate; and

exposing a portion of the dry polymer film to a source of electron radiation under high vacuum so as to form a pattern of exposed polymer film within the portion of the dry polymer film.

18. The method of Claim 17, further comprising the step of removing a portion of the dry polymer film from the substrate so as to leave the pattern of exposed polymer film on the substrate.

19. The method of Claim 17, wherein the source of electron radiation is a focused electron beam and the step of exposing a portion of the dry polymer film to the source of radiation energy includes the step of rastering the focused electron beam across a series of positions over the portion of dry polymer film.

20. The method of Claim 19, wherein the step of exposing a portion of the dry polymer film to the source of electron radiation includes the step of modulating the intensity of the exposure of the portion of dry polymer film at each of the positions so that the intensity of the exposure within the pattern varies along a dimension parallel to a surface of the dry polymer film.

21. The method of Claim 19, wherein the dry polymer film is exposed to radiation energies in a range of from about 500 eV to about 300 keV and the focused electron beam has a characteristic diameter of from about 1 nanometer to about 1 micron.

22. The method of Claim 19, wherein the dry polymer film is exposed to radiation energies in a range of from about 500 eV to about 20 keV and the focused electron beam has a characteristic diameter of from about 1 nanometer to about 1 micron.

23. The method of Claim 17, wherein the step of exposing a portion of the dry polymer film to a source of electron radiation includes the steps of forming a patterned radiation mask and then placing the patterned radiation mask between the portion of the dry polymer film and the source of electron radiation so that areas of the film outside of the pattern are exposed to substantially less radiation energy than are the areas of the film within the pattern.

24. The method of Claim 23, wherein the portion of the dry polymer film is exposed to radiation energies in a range of from about 500 eV to about 300 keV

25. The method of Claim 23, wherein the portion of the dry polymer film is exposed to radiation energies in a range of from about 10 keV to about 300 keV.

26. The method of Claim 17, wherein the high vacuum is on the order of 10^{-6} Torr.

27. The method of Claim 18, wherein the substrate is an inorganic substrate.

28. A method of controlling protein adsorption on a polymer film, comprising the steps of:

forming a dry polymer film on a substrate, said polymer film being resistant to the adsorption of proteins;

exposing a portion of the dry polymer film to a source of electron radiation under high vacuum so as to form a pattern of highly cross-linked polymer film within the portion of dry polymer film; and

contacting the dry polymer film with a medium containing a protein, whereby the protein adsorbs to the pattern of highly cross-linked polymer film.

29. The method of Claim 28, wherein the source of electron radiation is a focused electron beam and the step of exposing a portion of the dry polymer film to the source of electron radiation includes the step of rastering the focused electron beam across a series of positions over the portion of dry polymer film.

30. The method of Claim 29, wherein the step of exposing a portion of the dry polymer film to the source of electron radiation includes the step of modulating the intensity of the exposure of the portion of dry polymer film at each of the positions so that the intensity of the exposure within the pattern varies along a dimension parallel to a surface of the dry polymer film.

31. The method of Claim 28, wherein the step of exposing a portion of the dry polymer film to a source of electron radiation includes the steps of forming a patterned radiation mask that passes radiation through the pattern and then placing the patterned radiation mask between the portion of the dry polymer film and the source of radiation energy so that areas of the film outside of the pattern are exposed to substantially less radiation energy than are the areas of the film within the pattern.

32. A method of controlling cell adhesion on a polymer film, comprising the steps of:

forming a dry polymer film on a substrate, said polymer film being resistant to cell adhesion;

exposing a portion of the dry polymer film to a source of electron radiation under high vacuum so as to form a pattern of highly cross-linked polymer film within the portion of dry polymer film; and

contacting the dry polymer film with a medium having cells therein, whereby a cell adheres to the highly cross-linked polymer film within the pattern.

33. The method of Claim 32, wherein the source of electron radiation is a focused electron beam and the step of exposing a portion of the dry polymer film to the source of electron radiation includes the step of rastering the focused electron beam across a series of positions over the portion of dry polymer film.

34. The method of Claim 33, wherein the step of exposing a portion of the dry polymer film to the source of electron radiation includes the step of modulating the intensity of the exposure of the portion of dry polymer film at each of the positions so that the intensity of the exposure within the pattern varies along a dimension parallel to a surface of the dry polymer film.

35. The method of Claim 32, wherein the step of exposing a portion of the dry polymer film to a source of electron radiation includes the steps of forming a patterned radiation mask that passes radiation through the pattern and then placing the patterned radiation mask between the portion of the dry polymer film and the source of radiation energy so that areas of the film outside of the pattern are exposed to substantially less radiation energy than are the areas of the film within the pattern.

ABSTRACT

Surface-patterned microgels are formed by treating polymer films like electron-beam photoresists, but without destroying or removing the patterned microgels from their substrate. Focused electron beams are used to create patterned microgels on surfaces where the enhanced spatial resolution can be exploited to create gels with characteristic length scales relevant to cellular and sub-cellular processes. Varying the beam intensity allows control of the concentration of proteins that adhere to the resulting microgel. The process can be used to precisely locate the adhesive junction between cells and a substrate and to confine cell growth within defined areas.

Banks, Kendra

From: Dicus, Tamra
Sent: Thursday, January 19, 2006 3:48 PM
To: STIC-EIC1700
Subject: Database Search Request, Serial Number: 10/626,472

Requester:
Tamra Dicus (TC1700)
Art Unit:
1774
Employee Number:
79110
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2-1519
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Case serial number:
10/626,472
Class / Subclass(es):

Earliest Priority Filing Date:

Format preferred for results:
Paper
Search Topic Information:
patterned polymer microgels (all claims) thx.
Special Instructions and Other Comments:

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FILE 'HCA' ENTERED AT 12:58:15 ON 20 JAN 2006
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     FILE 'LCA' ENTERED AT 11:53:00 ON 20 JAN 2006
L1          7369 SEA (RADIA? OR IRRAD? OR RAY# OR BEAM? OR EMANAT? OR
                 EMIT? OR EMISS? OR PHOTOLY? OR BOMBARD? OR HOWITZER? OR
                 ENERG?(A)SOURC?)/BI,AB

     FILE 'HCA' ENTERED AT 12:00:23 ON 20 JAN 2006
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                 IMPACT? OR I!PING? OR STRIKE# OR STRIKING# OR COLLID? OR
                 COLLISION? OR HIT OR HITS OR HITTING#) OR CRT OR
                 CATHOD?(2A)RAY#(2A)TUBE#
L3             9 SEA (PATTERN? OR DESIGN OR DESIGNS OR DESIGNED OR
                 DESIGNING#)(5A)(POLYM? OR COPOLYM? OR HOMOPOLYM? OR
                 TERPOLYM? OR RESIN? OR SYNTHETIC? OR ARTIFICIAL? OR
                 MANMADE# OR MAN(A)MADE#)(5A)(MICROGEL? OR MICRO(A)(GEL
                 OR GELS OR GELLED OR GELLING# OR GELATION? OR GELATIN?))
L4                 QUE PATTERN? OR DESIGN OR DESIGNS OR DESIGNED OR
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L5           962 SEA (POLYM? OR COPOLYM? OR HOMOPOLYM? OR TERPOLYM? OR
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L6          4785 SEA RAST?
L7         34259 SEA (PROTEIN? OR PEPTID? OR POLYPEPTID?)(3A)(AFFINIT? OR
                 ADSORP? OR ADSORB? OR CHEMISORB? OR CHEMISORP? OR SORP?
                 OR SORB?)
L8        265791 SEA (CELL OR CELLS OR CELLULAR?)(3A)(GROW? OR ADHER? OR
                 ADHES? OR CLING? OR STICK? OR BIND?)
L9            38 SEA L4 AND L5
L10            2 SEA L9 AND L2
L11            0 SEA L9 AND L6
L12            1 SEA L9 AND L7
L13            1 SEA L9 AND L8
L14         2857 SEA MICROGEL? OR MICRO(A)(GEL OR GELS OR GELLED OR
                 GELLING# OR GELATION? OR GELATIN?)
L15          159 SEA L14 AND L4
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L16           8 SEA L15 AND (L2 OR L6 OR L7 OR L8)
L17          22 SEA L2 AND L14
L18           1 SEA L17 AND (L6 OR L7 OR L8)
L19           2 SEA L17 AND L9

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L21          69 SEA SUKHISHVILI ?/AU
L22          12 SEA KRSKO ?/AU
L23           4 SEA L20 AND L21 AND L22

     FILE 'HCA' ENTERED AT 12:42:59 ON 20 JAN 2006
L24        1391 SEA MICROHYDROGEL? OR (MICRO? OR NANO? OR SUBMICRO?)(3A)H
                YDROGEL? OR NANOHYDROGEL? OR NANOGEL? OR NANO(A)(GEL OR
                GELS OR GELLED OR GELLING# OR GELATION? OR GELATIN?)
L25      115716 SEA ARRAY?
L26      142372 SEA (CELL OR CELLS OR CELLULAR?)(2A)PROLIF?
L27      500349 SEA ANTIBOD? OR IMMUNOGLOB? OR FIBRONECTIN?
L28           1 SEA L9 AND (L26 OR L27)
L29           4 SEA L15 AND (L26 OR L27)
L30           1 SEA L17 AND (L26 OR L27)
L31         389 SEA (L14 OR L24) AND (L4 OR L25)
L32          17 SEA L31 AND (L2 OR (ELECTRON# OR E)(2A)SCAN?)
L33           5 SEA L32 AND (L6 OR L7 OR L8 OR L26 OR L27)
L34       19208 SEA HYDROGEL? OR HYDRO(A)(GEL OR GELS OR GELLED OR
                GELLING# OR GELATIN? OR GELATION?)
L35        1437 SEA L34 AND (L4 OR L25)
L36          26 SEA L35 AND (L2 OR (ELECTRON# OR E)(2A)SCAN?)
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L38          24 SEA L3 OR L10 OR L12 OR L13 OR L16 OR L18 OR L19 OR L28
                OR L29 OR L30 OR L33 OR L37
L39          38 SEA (L17 OR L32 OR L36) NOT L38
L40          30 SEA L9 NOT (L38 OR L39)
L41          10 SEA L38 AND (1840-2002/PY OR 1840-2002/PRY)
L42          23 SEA L39 AND (1840-2002/PY OR 1840-2002/PRY)
L43          24 SEA L40 AND (1840-2002/PY OR 1840-2002/PRY)


=> d l41 1-10 cbib abs hitind

L41  ANSWER 1 OF 10  HCA  COPYRIGHT 2006 ACS on STN
142:110123  Patterned polymer microgel and
     method of forming same.  Libera, Matthew R.; Sukhishvili, Svetlana
     A.; Krsko, Peter (Trustees of Stevens Institute of Technology, USA).
       U.S. Pat. Appl. Publ. US 2005008828 A1 20050113, 25 pp.
     (English).  CODEN: USXXCO.  APPLICATION: US 2003-626472 20030724.
```

PRIORITY: US 2002-2002/PV39839U 20020725; US 2003-2003/PV441658 20030122.

AB Surface-**patterned microgels** are formed by treating **polymer** films like **electron-beam** photoresists, but without destroying or removing the **patterned microgels** from their substrate. Focused **electron beams** are used to create **patterned microgels** on surfaces where the enhanced spatial resoln. can be exploited to create gels with characteristic length scales relevant to cellular and sub-cellular processes. Varying the beam intensity allows control of the concn. of proteins that adhere to the resulting **microgel.** The process can be used to precisely locate the **adhesive** junction between **cells** and a substrate and to confine **cell growth** within defined areas.

IC ICM B05D003-00
ICS G21H001-00
INCL 428195100; 427551000
CC 9-16 (Biochemical Methods)
ST **patterned polymer microgel**

IT **Adhesion**, biological
(**cell**, control using **electron beam patterning**; **patterned polymer microgel** and method of forming same)

IT Photolithography
Photoresists
(**electron beam**; **patterned polymer microgel** and method of forming same)

IT **Cell proliferation**
Microgels
Ultrathin films
(**patterned polymer microgel** and method of forming same)

IT Proteins
(**patterned polymer microgel** and method of forming same)

IT Polyoxyalkylenes, analysis
(**patterned polymer microgel** and method of forming same)

IT Cell
(processes; **patterned polymer microgel** and method of forming same)

IT **Adsorption**
(**protein**; **patterned polymer microgel** and method of forming same)

IT pH
(responsive **microgels**, PEO and PMMA; **patterned polymer microgel** and method of forming same)

IT 9011-14-7, PMMA 25249-16-5 25322-68-3, Polyethylene oxide
191858-68-1 507485-23-6
(**patterned polymer microgel** and
method of forming same)

L41 ANSWER 2 OF 10 HCA COPYRIGHT 2006 ACS on STN
139:237692 Copolymers, their manufacture, and chemical amplification-type resist compositions. Momose, Akira; Wakabayashi, Shigeo; Ueda, Shoji; Fujiwara, Masayuki (Mitsubishi Rayon Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003246825 A2 20030905, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-340817 20021125. PRIORITY: JP 2001-389720 20011221.

AB In the copolymers comprising .gtoreq.2 monomer units selected from monomer units having alicyclic groups, monomer units having lactone backbones, and copolymerizable vinyl monomer units, ratio of 3 lattices of each monomer unit is <15 mol%. The copolymers are manufd. by (1) dropping org. solvent solns. of each monomer using .gtoreq.2 dropping apps., (2) heating a part of monomers in a reactor and then dropping residual monomers into the reactor, or (3) dropping .gtoreq.2 monomer solns. having different compn. ratio of monomers. The resist compns. contg. the copolymers are useful for lithog. using deep-UV excimer laser light or **electron beam.** The copolymers show good soly. in resist solvents and prevented **microgel** generation in resist solns. and give resist **patterns** with good flatness of side walls.

IC ICM C08F220-18
ICS C08F002-06; C08F220-28; G03F007-039

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST deep UV resist copolymer solvent soly; **electron beam** resist **copolymer microgel** prevention; lithog deep UV resist copolymer

IT **Electron beam** resists
(manuf. of copolymers with good soly. in resist solvents for chem. amplification-type resists)

L41 ANSWER 3 OF 10 HCA COPYRIGHT 2006 ACS on STN
138:260134 Use of radiation in biomaterials science. Benson, Roberto S. (Material Science and Engineering, The University of Tennessee, Knoxville, TN, 37996-2200, USA). Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms, 191, 752-757 (English) **2002.** CODEN: NIMBEU. ISSN: 0168-583X. Publisher: Elsevier Science B.V..

AB A review with refs. Radiation is widely used in the biomaterials science for surface modification, sterilization and to improve bulk properties. Radiation is also used to **design** of biochips, and in situ photopolymerizable of bioadhesives. The energy sources most commonly used in the irradn. of biomaterials are high-energy

electrons, .gamma.-**radiation**, UV and visible light. Surface modification involves placement of selective chem. moieties on the surface of a material by chem. reactions to improve biointeraction for **cell adhesion** and **proliferation**, hemo-compatibility and water absorption. The exposure of a polymer to radiation, esp. ionizing radiation, can lead to chain scission or crosslinking with changes in bulk and surface properties. Sterilization by irradn. is **designed** to inactivate most pathogens from the surface of biomedical devices. An overview of the use of .gamma.- and UV radiation to improve surface tissue compatibility, bulk properties and surface properties for wear resistance, formation of **hydrogels** and curing dental sealants and bone adhesives is presented. .gamma.- And vacuum UV (VUV)-irradiated ultrahigh mol. wt. polyethylene (UHMWPE) exhibit improvement in surface modulus and hardness. The surface modulus and hardness of UHMWPE showed a dependence on type of radiation, dosage and processing. VUV surface modified e-PTFE vascular grafts exhibit increases in hydrophilicity and improvement towards adhesion of fibrin glue.

CC 63-0 (Pharmaceuticals)

L41 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN

134:209313 Network structure formation during crosslinking of organic coating systems. Dusek, K.; Duskova-Smrckova, M. (Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague, CZ-162 06/6, Czech Rep.). Progress in Polymer Science, 25(9), 1215-1260 (English) **2000**. CODEN: PRPSB8. ISSN: 0079-6700. Publisher: Elsevier Science Ltd..

AB A review with 123 refs. Crosslinking is a very important process in coating film formation and the structure of the formed network dets. the application properties of the coating film. In this review, general features of crosslinking and evaluation of network structure are described. Network formation theories and their applicability to special chem. systems are analyzed. The kinetics of network formation is usually controlled by chem. reactivity of functional groups. A transition to the regime controlled by segmental mobility is typical for film formation esp. for ambient temp. drying. Formation of inhomogeneities in multicomponent systems detd. by compn. and group reactivities and/or by thermodn. segregation may also play an important role. In the last section, special features of formation of crosslinked structured from designed precursors - polyfunctional mols. with **designed** backbone architectures, such as telechelic **polymers**, stars, combs, **microgels**, dendrimers, or hyperbranched polymers are reviewed. Introduction of precursors of special architecture allows us not only to modify the processing and material properties of the film, but also brings about new problems in explaining and modeling the formation and properties of coating films.

CC 42-0 (Coatings, Inks, and Related Products)

L41 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN
132:23393 Pattern change of stimuli-responsive polymers. Ito, Yoshihiro (Department of Biological Science and Technology, Faculty of Engineering, The University of Tokushima, Minami-jousanjima, Tokushima, 770-8506, Japan). Kobunshi Ronbunshu, 56(10), 617-625 (Japanese) **1999.** CODEN: KBRBA3. ISSN: 0386-2186. Publisher: Kobunshi Gakkai.
AB A review with 30 refs. on micro-**patterns** formed by stimuli-responsive **polymeric gels micro** -fabricated by photo-lithog. A stimulus-responsive polymer was also self-assembled on a porous membrane to regulate the mass permeation through the membrane. The at. force microscope revealed the pore gating in response to the stimulus.
CC 37-0 (Plastics Manufacture and Processing)

L41 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN
131:256007 Heterogeneous humoral immune responses in cerebrospinal fluid arising from inflammatory diseases of the human central nervous system. Detection of oligoclonal **immunoglobulin** bands after isoelectric focusing. Kleine, T. O. (Neurochemical Department, Centre of Nervous Diseases, hilipps University Marburg, D-35033, Marburg, D-35033, Germany). Analytica Chimica Acta, 393(1-3), 83-93 (English) **1999.** CODEN: ACACAM. ISSN: 0003-2670. Publisher: Elsevier Science B.V..
AB Automated isoelec. focusing (IEF) with polyacrylamide **micro gels** (PAGs) and immune fixation in the modified PhastSystemTM proved to be more sensitive and accurate for detecting oligoclonal Ig bands (OBs) in cerebrospinal fluid (CSF) than IEF with non-specific silver staining of bands or the calcn. of intrathecal IgG prodn. by 2 formulas comparing both routine OB assays and the formulas during inflammatory processes of the human central nervous system (CNS). Immune specific detection of OBs on parts of the .gamma. chain (Fc, CH2; Fab; Fd) and on the light chains .lambda., .kappa. yielded different nos. of OBs of which most indicated IgG .kappa. and/or IgG .lambda. subfractions in CSF differing in pI besides a varying ground **pattern** of Ig in CSF and blood serum samples. In some cases more OBs on .lambda. (or .kappa.) chains than found on the .gamma. chain indicate other Ig subfractions and/or free light chains. Heterogeneous IgG subfractions were found in acid, neutral, and alk. regions of the PAG gel with the OB assay with immune-specific band detection; they varied with different inflammations of the CNS and during the inflammatory process. Identical OBs in CSF and serum samples were detected during chronic degrdn. processes of the CNS; they indicate addnl. heterogeneous IgG subfractions in the CSF and blood compartment, probably involved with autoimmune processes.

CC 15-1 (Immunochemistry)
IT **Immunoglobulins**
(G, oligoclonal bands; oligoclonal Ig bands after isoelec. focusing of cerebrospinal fluid arising from inflammatory diseases of human central nervous system)
IT **Immunoglobulins**
(heavy chains; oligoclonal Ig bands after isoelec. focusing of cerebrospinal fluid arising from inflammatory diseases of human central nervous system)
IT **Immunoglobulins**
(light chains; oligoclonal Ig bands after isoelec. focusing of cerebrospinal fluid arising from inflammatory diseases of human central nervous system)

L41 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN
126:252239 Manufacture of linked microgels for adsorbents, filters, separation membranes, and design materials. Fukutomi, Takashi; Sugito, Yoshifumi; Takizawa, Minoru; Mizoguchi, Toku; Nakamura, Michei; Takeuchi, Hitoshi; Oguma, Naomi; Maruyama, Munehisa; Horiguchi, Shojiro (Dainichiseika Color Chem, Japan). Jpn. Kokai Tokkyo Koho JP 09048917 A2 **19970218** Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-219480 19950807.
AB Title microgels, which may be supported on films, papers, fibers, nonwoven fabrics, glasses, metals, ceramics, etc., are manufd. by polymg. permeated monomers in microgels dispersed and immobilized on polymer matrixes. Thus, 25 parts microgel (prepd. from styrene 30, hydroxyethyl methacrylate 3, and divinylbenzene 1.5 parts) and 50 parts 2% aq. hydroxypropyl cellulose were mixed, molded into a membrane, and treated with glutaraldehyde and HCl to give a microgel immobilized on the membrane, which was impregnated in an Me2CO soln. contg. 4.5 parts styrene, 0.05 part divinylbenzene, and 2,2'-azobisisobutyronitrile for 24 h and heated at 55.degree. for 24 h to give a porous membrane (pore size .apprx.40 nm) for a filter.
IC ICM C08L101-00
ICS B01D071-06; B01J013-00; B32B027-00; B32B027-10; B32B027-12; C08F002-00; C08K005-00
CC 38-3 (Plastics Fabrication and Uses)
ST microgel polymer linking adsorbent filter; sepn membrane microgel polymer linking; **design** material **microgel polymer** linking

L41 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN
125:276741 Molecular **design** of vinyl-type **microgel polymers.** Characterization of **microgels** with light scattering. Matsumoto, Akira; Takahashi, Shigeaki; Morita, Takehiko (Fac. Eng., Kansai Univ., Suita, 564, Japan). Nettowaku Porima, 17(3), 139-148 (Japanese) **1996.** CODEN: NPORF2. Publisher: Gosei Jushi Kogyo Kyokai.

AB A useful guideline for mol.-**design** of vinyl-type **microgel polymers** was obtained by pursuing the possibility of microgel formation up to the gel point conversion in the radical polymn. of ethylene dimethacrylate (EDMA) and its copolymn. with Me methacrylate (MMA) using a direct method to measure the light scattering of their polymn. solns. The direct measurement of light scattering of polymn. solns. without isolating the prepolymers would be a useful tool of pursuit of microgelation since the significant decreases in the radius of gyration and the second virial coeff. were obsd. under the polymn. conditions where an occurrence of intramol. crosslinking leading to microgel formation is expected to be enhanced. The microgelation in the homopolymn. of EDMA was pursued by changing the added amt. of chain transfer reagent. In MMA-EDMA copolymns. the influence of the content of pendant vinyl groups of primary polymer on microgelation was suggested to be remarkable; no microgelation was verified in the case where the added amt. of EDMA is quite small. The intramol. crosslinking reaction was sterically suppressed in the MMA-EDMA (90:10) copolymn.

CC 35-4 (Chemistry of Synthetic High Polymers)

L41 ANSWER 9 OF 10 HCA COPYRIGHT 2006 ACS on STN

125:30155 Culture and electrofusion of plant cell protoplasts under microgravity: Morphological and biochemical characterization. Hoffmann, E.; Schoenherr, K.; Johann, P.; Hampp, R. (Universitat Tubingen, Germany). Proceedings of the Norderney Symposium on Scientific Results of the German Spacelab Mission D-2, Norderney, Germany, Mar. 14-16, 1994, Meeting Date 1994, 641-656. Editor(s): Sahm, Peter R.; Keller, Manfred H.; Schiewe, Berthold. Wissenschaftliche Projektfuehrung D-2: Cologne, Germany. (English) **1995.** CODEN: 62WTAJ.

AB Plant cell protoplasts derived from leaf tissue of two different tobacco species (Nicotiana tabacum, N. rustica), and fusion products formed from the parental lines by elec. cell fusion techniques, were cultured for about 10 days under microgravity conditions in parallel to 1g controls. In defined time intervals sample aliquots were taken in order to compare morphol. and physiol. properties of the cells. The fixatives (glutaraldehyde, ethanol, NaOH and HCI) were chosen to allow microscopic investigation, protein anal., and comparison of energy and carbohydrate metab. The protoplasts showed good viability and regenerated well both in orbit and on ground. Typical developmental stages could be obsd. in all glutaraldehyde samples. The time course of development was homogeneous for all cultures, general .mu.g-effects on **cell growth** were not detected. The microcalli were cultivated further in the home lab. and proved to have retained good morphogenic capacity. The ethanol-pptd. samples were solubilized for SDS-PAGE and were analyzed in a **microgel** system. Differences in the total

cell protein **pattern** occurred with culture age, but not between different growth conditions. Total protein exts. were screened for specific cytoskeletal polypeptides by immunoblotting with **antibodies** against tubulin and actin. Characteristic **patterns** were obtained, but they, too, were not influenced by gravity conditions. The key compds. of energy metab. in plants, ATP, ADP, NADH, NADPH, NAD, and NADP were detd. from the acidic and alk. exts., together with fructose-2,6-bisphosphate, a metabolite which regulates the balance between glycolysis and gluconeogenesis. The combination of growth and metabolite parameters points towards a down-regulation of energy metab. in **cells grown** under .mu.g, while retaining lg rates of **cell** division and **growth.**

CC 11-3 (Plant Biochemistry)

L41 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN

119:103276 Bilayer composite **hydrogels** for corneal prostheses. Perez, Edward; Cima, Linda G.; Miller, David; Merrill, Edward W. (Dep. Chem. Eng., Massachusetts Inst. Technol., MA, USA). Materials Research Society Symposium Proceedings, 252(Tissue-Inducing Biomaterials), 375-85 (English) **1992.** CODEN: MRSPDH. ISSN: 0272-9172.

AB A two-layer composite material composed of a thin-layer of corneal tissue and a synthetic polyethylene oxide (PEO) **hydrogel** is described. The material is **designed** to provide a suitable substrate for corneal epithelial **cell growth** while maintaining the desirable characteristics of **hydrogels**, i.e. clarity, flexibility, and ability to allow diffusive flow of nutrients. The gels are synthesized via **electron irradn.** induced crosslinking of an aq. soln. of PEO onto a thin layer of collagenous tissue substrate. Light microscopic studies indicate that the interface between the corneal tissue and PEO gel appears well adherent with no gaps in the interface. SEM studies of the material surface show an architecture similar to that of normal corneal tissue. Surface anal. techniques were used to identify amino-acids covalently bound to the gel at the gel/collagen interface after the proteinaceous material was removed. ESCA survey scans identified the presence of nitrogen on gel/collagen interfaces and amino acid labeling confirmed the presence of amino acids. ATR-IR studies identified increased absorption for the gel collagen interfaces at 1640 cm-1 and 1540 cm-1 indicative of bound amino acids.

CC 63-7 (Pharmaceuticals)

ST cornea prosthesis collagen polyoxyethylene composite; composite **hydrogel** collagen polyoxyethylene eye

IT Interface
(of polyethylene oxide **hydrogel** with fibrillar collagen, characterization of, in composite corneal prostheses)

IT Collagens, biological studies
(with polyethylene oxide **hydrogels**, as composite corneal prostheses)
IT Eye
(cornea, artificial, bilayer composite of polyethylene oxide **hydrogel** and fibrillar collagen as, prepn. of)
IT Prosthetic materials and Prosthetics
(implants, bilayer composite of polyethylene oxide **hydrogel** and fibrillar collagen as corneal)

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L42 ANSWER 1 OF 23 HCA COPYRIGHT 2006 ACS on STN
138:142345 Synthesis and evaluation of sucrose-containing polymeric **hydrogels** for oral drug delivery. Shantha, K. L.; Harding, D. R. K. (Institute of Fundamental Sciences-Chemistry, College of Sciences, Massey University, Palmerston North, N. Z.). Journal of Applied Polymer Science, 84(14), 2597-2604 (English) **2002.** CODEN: JAPNAB. ISSN: 0021-8995. Publisher: John Wiley & Sons, Inc..

AB Biodegradable and biocompatible copolymeric **hydrogels** based on sucrose acrylate, N-vinyl-2-pyrrolidinone, and acrylic acid were **designed** and synthesized. Because of the growing importance of sugar-based **hydrogels** as drug delivery systems, these new pH-responsive sucrose-contg. copolymeric **hydrogels** were investigated for oral drug delivery. The sucrose acrylate monomer was synthesized and characterized. The copolymeric **hydrogel** was synthesized by free-radical polymn. Azobisisobutyronitrile (AIBN) was the free-radical initiator employed and bismethyleneacrylamide (BIS) was the crosslinking agent used for **hydrogel** prepns. Homopolymeric vinyl pyrrolidone **hydrogels** were also prepd. by the same technique. The **hydrogels** were characterized by differential scanning calorimetry, thermogravimetric anal., and SEM. Equil. swelling studies were carried out in enzyme-free simulated gastric and intestinal fluids (SGF and SIF, resp.). These results indicate the pH-responsive nature of the **hydrogels** . The gels swelled more in SIF than in SGF. A model drug, propranolol hydrochloride (PPH), was entrapped in these gels and the in vitro release profiles were established sep. in both enzyme-free SGF and enzyme-free SIF. The drug release was found to be faster in SIF. About 93 and 99% of the entrapped drug was released over a period of 24 h in SGF and SIF, resp.

CC 63-6 (Pharmaceuticals)
Section cross-reference(s): 38
ST sucrose polymeric **hydrogel** oral drug delivery calorimetry swelling thermogravimetry

IT Drug delivery systems
(**hydrogels**; synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT Drug delivery systems
(oral; synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT pH
(response; synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT Biocompatibility
Differential scanning calorimetry
Dissolution
Scanning electron microscopy
Swelling, physical
Thermogravimetric analysis
(synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT 318-98-9, Propranolol hydrochloride
(model drug; synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT 491869-22-8P, Acrylic acid-N-vinyl-2-pyrrolidone-sucrose acrylate copolymer
(synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)
IT 138790-70-2P
(synthesis and evaluation of sucrose-contg. polymeric **hydrogels** for oral drug delivery)

L42 ANSWER 2 OF 23 HCA COPYRIGHT 2006 ACS on STN
138:112376 Responsive **Hydrogels** from the Intramolecular Folding and Self-Assembly of a **Designed** Peptide.
Schneider, Joel P.; Pochan, Darrin J.; Ozbas, Bulent; Rajagopal, Karthikan; Pakstis, Lisa; Kretsinger, Juliana (Departments of Chemistry and Biochemistry and Materials Science and Engineering and the Delaware Biotechnology Institute, University of Delaware, Newark, DE, 19716, USA). Journal of the American Chemical Society, 124(50), 15030-15037 (English) **2002.** CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.
AB A general peptide **design** is presented that links the pH-dependent intramol. folding of .beta.-hairpin peptides to their propensity to self-assemble, affording **hydrogels** rich in .beta.-sheet. Chem. responsiveness has been specifically engineered into the material by linking intramol. folding to changes in soln. pH and mech. responsiveness by linking **hydrogelation** to self-assembly. Circular dichroic and IR spectroscopies show that at low pH individual peptides are unstructured, affording a low-viscosity aq. soln. Under basic conditions, intramol. folding takes place, affording amphiphilic .beta.-hairpins that

intermolecularly self-assemble. Rheol. shows that the resulting **hydrogel** is rigid but is shear-thinning. However, quick mech. strength recovery after cessation of shear is obsd. due to the inherent self-assembled nature of the scaffold. Characterization of the gelation process, from the mol. level up through the macroscopic properties of the material, suggests that by linking the intramol. folding of small **designed** peptides to their ability to self-assemble, responsive materials can be prepd. Cryo-transmission **electron** and laser **scanning** confocal microscopies reveal a water-filled porous scaffold on both the nano- and microscale. The environmental responsiveness, morphol., and peptidic nature make this **hydrogel** a possible material candidate for biomedical and engineering technol.

CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 34

ST hairpin peptide intramol folding self assembly **hydrogel**

IT Conformation
(hairpin loop; responsive **hydrogels** from intramol. folding and self-assembly of .beta.-hairpin peptides)

IT Gelation
Hydrogels
Self-assembly
(responsive **hydrogels** from intramol. folding and self-assembly of .beta.-hairpin peptides)

IT Peptides, biological studies
(responsive **hydrogels** from intramol. folding and self-assembly of .beta.-hairpin peptides)

IT 487036-63-5, MAX 1
(responsive **hydrogels** from intramol. folding and self-assembly of .beta.-hairpin peptides)

L42 ANSWER 3 OF 23 HCA COPYRIGHT 2006 ACS on STN

137:139479 Low-temperature electron microscopy for the study of polysaccharide ultrastructures in **hydrogels.** I. Theoretical and technical considerations. Serp, D.; Mueller, M.; Von Stockar, U.; Marison, I. W. (Laboratory for Chemical and Biological Engineering, Chemical Department, Swiss Federal Institute of Technology (EPFL), Lausanne, 1015, Switz.). Biotechnology and Bioengineering, 79(3), 243-252 (English) **2002.** CODEN: BIBIAU. ISSN: 0006-3592. Publisher: John Wiley & Sons, Inc..

AB The high-pressure freezing (HPF) technique was applied to the cryo-immobilization of alginate gels and the quality of the freezing analyzed on a TEM by comparison of the segregation **pattern** of samples of decreasing thickness. Dynamic simulations of heat transfer within an idealized slab of pure water surrounded by two walls of aluminum were performed to illustrate the effect of the heat-transfer coeff. by convection on the cooling rate of the sample. Heat-transfer coeffs. in liq. nitrogen and liq. propane at

ambient pressure were measured using a carefully characterized thermocouple and the values incorporated as parameters in heat-transfer simulations to compare the efficiency of the plunge-freezing technique with the high-pressure freezing technique. Values of the heat-transfer coeff. in liq. nitrogen and liq. propane, calcd. between 273 K and 173 K were 670 and 18420 W/m2/K, resp. Based on TEM observations and the results of heat-transfer simulations, the HPF technique was adapted to the cryo-fixation of 50-.mu.m-thick alginate gels. The occurrence of artifacts was rejected because no differences were obsd. in the **pattern** of cryo-fixed and freeze-substituted samples of various thickness, with and without ethanol as cryo-protectant. A sample thickness of 50 .mu.m was found to ensure an adequate preservation of structures as small as a few nanometers, as verified by TEM and SEM observations. Finally, DSC measurements on alginate solns. and alginate beads revealed that under the exptl. conditions (0-3%), alginate cannot be considered to be an efficient cryo-protectant.

CC 16-8 (Fermentation and Bioindustrial Chemistry)

ST polysaccharide ultrastructure **hydrogel** electron **microscopy** temp math model

IT Freezing
Heat transfer
Hydrogels
Immobilization, molecular or cellular
Scanning electron microscopy
Simulation and Modeling
Temperature effects, biological
Transmission electron microscopy
(low-temp. electron **microscopy** for study of polysaccharide ultrastructures in **hydrogels.** I. Theor. and tech. considerations)

IT Polysaccharides, biological studies
(low-temp. electron microscopy for study of polysaccharide ultrastructures in **hydrogels.** I. Theor. and tech. considerations)

IT 9005-32-7, Alginic acid
(low-temp. electron microscopy for study of polysaccharide ultrastructures in **hydrogels.** I. Theor. and tech. considerations)

L42 ANSWER 4 OF 23 HCA COPYRIGHT 2006 ACS on STN

136:315423 The Influence of Cold Treatment on Properties of Temperature-Sensitive Poly(N-isopropylacrylamide) **Hydrogels**. Zhang, Xian-Zheng; Yang, Yi-Yan; Chung, Tai-Shung (Institute of Materials Research and Engineering, Singapore, 117602, Singapore). Journal of Colloid and Interface Science, 246(1), 105-111 (English) **2002.** CODEN: JCISA5. ISSN: 0021-9797. Publisher: Academic Press.

AB Poly(N-isopropylacrylamide) (PNIPAAm) **hydrogel** exhibits a response to external temp. variation and shrinks in vol. abruptly as the temp. is increased above its lower crit. soln. temp. It has great potential applications in biomedical fields. A rapid response rate is essential, esp. when this material is **designed** as an on-off switch for targeted drug delivery. However, due to the appearance of a thick, dense skin layer on the **hydrogel** surface during the shrinking process, the deswelling rate of conventional PNIPAAm gels is low. In this article, a novel method is proposed to modify the surface morphol. of PNIPAAm gel, in which the swollen gels are frozen at low temp. (-20.degree.C). The **scanning electron** micrographs revealed that a fishnet-like skin layer appeared on the surfaces of the cold-treated gels. Dramatically rapid deswelling was achieved with the cold-treated gels since the fishnet-like structure with numerous small pores prevented the formation of a dense, thick skin layer during the deswelling process, which commonly occurs in normal PNIPAAm **hydrogels.** Prolonging the cold treatment from 1 day to 10 days resulted in a slightly higher deswelling rate. Rearrangement of the **hydrogel** matrix structure during the freezing process might contribute to the formation of the fishnet-like skin layer. The water uptake of the **hydrogels** increased nearly in proportion to the square root of time, indicating that the reswelling rate of **hydrogels** was controlled predominantly by water diffusion into the network. However, there were no significant differences in the equilibrated swelling ratio and reswelling kinetics at room temp. (22.degree.C) between normal gels and cold-treated gels, which implied that cold treatment did not change bulk porosity and gel tortuosity much.

CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 63

ST cold treatment property polyisopropylacrylamide **hydrogel**; surface morphol polyisopropylacrylamide **hydrogel** freezing swelling

IT Freeze drying
Hydrogels
Porosity
Surface structure
Swelling, physical
Volume
(influence of cold treatment on properties of temp.-sensitive poly(N-isopropylacrylamide) **hydrogels**)

IT Diffusion
(water; influence of cold treatment on properties of temp.-sensitive poly(N-isopropylacrylamide) **hydrogels**)

IT 25189-55-3, Poly(N-isopropylacrylamide)
(influence of cold treatment on properties of temp.-sensitive

poly(N-isopropylacrylamide) **hydrogels**)

L42 ANSWER 5 OF 23 HCA COPYRIGHT 2006 ACS on STN
136:28386 A New Application for **Microgels**: Novel Method for the Synthesis of Spherical Particles of the Y2O3:Eu Phosphor Using a Copolymer **Microgel** of NIPAM and Acrylic Acid.
Martinez-Rubio, M. I.; Ireland, T. G.; Fern, G. R.; Silver, J.; Snowden, M. J. (Centre for Phosphors and Display Materials Chemical and Life Sciences, University of Greenwich, Woolwich London, SE18 6PF, UK). Langmuir, 17(22), 7145-7149 (English) **2001.**
CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.
AB The prepn. of spherical phosphor Eu-doped Y2O3 particles using a copolymer of N-isopropylacrylamide (NIPAM) and acrylic acid is described. The resulting phosphor particles have smaller particle diams. (<0.1 .mu.m) compared to both com. Y2O3:Eu phosphors and spherical particles synthesized by the urea pptn. method. Cathodoluminescence measurements demonstrate that exceptional light output is achieved from the particle diams. <0.1 .mu.m. The luminescence of the phosphors synthesized via the copolymer **microgel** are at least comparable to com. products at lower voltages; they offer the distinct advantage of a higher packing d. and higher resoln. for field emissive displays and **cathode ray tube** applications.
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
ST europium doped yttria phosphor acrylic acid propylacrylamide copolymer **microgel**
IT **Microgels**
(europium-doped yttria phosphor spherical particles synthesis using acrylic acid-isopropylacrylamide copolymer)
IT Phosphors
(europium-doped yttria spherical particles synthesis using acrylic acid-isopropylacrylamide copolymer **microgel**)
IT 22541-18-0P, Europium(3+), properties
(-doped yttria phosphor spherical particles synthesis using acrylic acid-isopropylacrylamide copolymer **microgel**)
IT 1314-36-9P, Yttria, properties
(europium-doped phosphor spherical particles synthesis using acrylic acid-isopropylacrylamide copolymer **microgel**)
IT 79042-19-6, Acrylic acid-N-isopropylacrylamide copolymer
(europium-doped yttria phosphor spherical particles synthesis using **microgel** of)

L42 ANSWER 6 OF 23 HCA COPYRIGHT 2006 ACS on STN
135:181858 **Electron-beam irradiation** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of

trimethylolpropane triacrylate. Ratnam, Chantara Thevy; Nasir, M.; Baharin, A.; Zaman, Khairul (Radiation Processing Technology Division, Malaysian Institute for Nuclear Technology Research (MINT), Bangui, 43000, Malay.). Journal of Applied Polymer Science, 81(8), 1926-1935 (English) **2001.** CODEN: JAPNAB. ISSN: 0021-8995. Publisher: John Wiley & Sons, Inc..

AB **Electron-beam** initiated crosslinking of poly(vinyl chloride)/epoxidized natural rubber blends, which contained trimethylolpropane triacrylate (TMPTA), was carried out over a range of irradn. doses (20-200 kGy) and concns. of TMPTA (1-5 phr). The gel content increased with the irradn. dose and the TMPTA level, although the increase was marginal at higher doses and higher TMPTA levels. Blends contg. 3-4 phr TMPTA achieved optimum crosslinking, which in effect caused the max. tensile strength (TS) at a dose of 70 kGy. A further addn. of TMPTA caused a decline in the TS above 40 kGy that was due to embrittlement, which is a consequence of excessive crosslinking and the breakdown of the network structure. The possible formation of a more open network as a result of the breakdown of the network structure was further confirmed by the modulus results. Dynamic mech. anal. (tan.delta. curve) and SEM studies on samples irradiated at 0 and 200 kGy were undertaken in order to gain further evidence on the irradn.-induced crosslinking. The plasticizing effect of TMPTA prior to irradn. and the formation of **microgels** upon irradn. were also discussed.

CC 39-10 (Synthetic Elastomers and Natural Rubber)
Section cross-reference(s): 37

ST **electron beam** crosslinking epoxidized natural rubber; PVC epoxidized natural rubber blend crosslinking; trimethylolpropane triacrylate crosslinking PVC natural rubber

IT Glass transition temperature
Hardness (mechanical)
Mechanical loss
Tensile strength
(**electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)

IT Polymer blends
(**electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)

IT Natural rubber, properties
(epoxidized, Epoxyprene 50; **electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)

IT Polymer morphology
(fracture-surface; **electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber

blends in presence of trimethylolpropane triacrylate)
IT Fracture surface morphology
(polymeric; **electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)
IT Crosslinking
Vulcanization
(radiochem.; **electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)
IT 15625-89-5, Trimethylolpropane triacrylate
(**electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)
IT 9002-86-2, MH66
(**electron-beam irradn.** of poly(vinyl chloride)/epoxidized natural rubber blends in presence of trimethylolpropane triacrylate)

L42 ANSWER 7 OF 23 HCA COPYRIGHT 2006 ACS on STN
135:123131 Thermo-sensitive poly(methyl vinyl ether) **micro-gel** formed by high energy radiation. Arndt, K.-F.; Schmidt, T.; Reichelt, R. (Institute of Physical Chemistry and Electrochemistry, Dresden University of Technology, Dresden, D-01062, Germany). Polymer, 42(16), 6785-6791 (English) **2001.** CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..
AB A thermo-sensitive hydrogel was synthesized by irradn. of an aq. soln. of poly(Me vinyl ether) (PMVE) with electrons. At high polymer concn. a bulk gel was formed. Irradn. of dild. polymer soln. at a temp. above the phase transition temp. conserves the structure of the polymer in the phase-sepd. state. The micro-particles formed under irradn. conditions possess also typical thermo-sensitive properties. Their diam. roughly amts. to 300-500 nm in the swollen state depending on the temp. of the soln. Static and dynamic light scattering were used to det. the dimension of the formed particles. The dry, swollen, and shrunk state were structurally characterized by field emission SEM (FESEM).
CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
ST heat sensitive polymethyl vinyl ether **microgel**; **electron irradn** polymethyl vinyl ether **microgel**
IT **Electron beams**
(**irradn.**; thermo-sensitive poly(Me vinyl ether) **microgel** formed by **electron irradn.**)
IT Heat-sensitive materials
Microgels

Polymer morphology
(thermo-sensitive poly(Me vinyl ether) **microgel** formed by **electron irradn.**)

IT 9003-09-2, Poly(methyl vinyl ether)
(thermo-sensitive poly(Me vinyl ether) **microgel** formed by **electron irradn.**)

L42 ANSWER 8 OF 23 HCA COPYRIGHT 2006 ACS on STN
134:286969 Externallateral endoscope component. Hayakawa, Shinji; Adachi, Rensuke; Ikeda, Kunitoshi; Abe, Masanao (Asahi Kogaku Kogyo K.K., Japan). Ger. Offen. DE 10047123 A1 **20010405**, 8 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2000-10047123 20000922. PRIORITY: JP 1999-267930 19990922.

AB A externallateral endoscope component contains a basis element consisting of an Al alloy, whose surface is subjected to the anodic oxidn. and afterwards to an electrolytic deposition and **microgel** applications. The stability against corrosion and disinfection properties are analyzed for a new system.

IC ICM C25D011-20
ICS C23C028-00; A61B001-00

CC 72-7 (Electrochemistry)
Section cross-reference(s): 63

ST externallateral endoscope component aluminum alloy anodization electroplating **microgel**

IT Anodization
Electrodeposition
Endoscopes
Microgels
Oxidation, electrochemical
(externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

IT Corrosion
(stability against; externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

IT Aluminum alloy, base
(externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

IT 7722-84-1, Hydrogen peroxide, uses
(disinfecting agent; externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

IT 165039-36-1, Elecoat AM-1 173939-72-5, Elecoat nicelon 332350-68-2, Elecoat AMF-YT 332350-70-6, **CRT** 1
(externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

IT 7429-90-5, Aluminum, uses
(externallateral endoscope component subjected to anodization and

electrodeposition and **microgel** application)
IT 1344-28-1P, Aluminum oxide, uses
(externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)
IT 144-62-7, Oxalic acid, processes 7664-93-9, Sulfuric acid, processes 7738-94-5, Chromic acid (H2CrO4)
(externallateral endoscope component subjected to anodization and electrodeposition and **microgel** application)

L42 ANSWER 9 OF 23 HCA COPYRIGHT 2006 ACS on STN
132:241841 Controlled release of antihypertensive drug from the interpenetrating network poly(vinyl alcohol)-guar gum **hydrogel microspheres.** Soppimath, Kumaresh S.; Kulkarni, Anandrao R.; Aminabhavi, Tejraj M. (Department of Chemistry, Karnatak University, Dharwad, 580003, India). Journal of Biomaterials Science, Polymer Edition, 11(1), 27-43 (English) **2000.** CODEN: JBSEEA. ISSN: 0920-5063. Publisher: VSP BV.
AB Poly(vinyl alc.)-guar gum interpenetrating network microspheres were prepd. by crosslinking with glutaraldehyde. Nifedipine, an antihypertensive drug, was loaded into these matrixes before and after crosslinking to study its release **patterns.** The extent of crosslinking was analyzed by Fourier transform IR spectroscopy and differential scanning calorimetry. Furthermore, the microspheres were characterized for drug entrapment efficiency, particle size, transport of water into the matrix and drug release kinetics. **Scanning electron** microscopic photographs confirmed the spherical nature and surface morphol. The mean particle size of the microspheres was around 300 .mu.m. The mol. transport phenomenon, as studied by the dynamic swelling expts., indicated that an increase in crosslinking affected the transport mechanism from Fickian to non-Fickian. The in vitro release study indicated that the release from these microspheres is not only dependent upon the extent of crosslinking, but also on the amt. of the drug loaded as well as the method of drug loading.
CC 63-6 (Pharmaceuticals)
IT Crosslinking
Diffusion
Dissolution rate
Interpenetrating polymer networks
Particle size distribution
Swelling, physical
(controlled release of nifedipine from interpenetrating network poly(vinyl alc.)-guar gum **hydrogel microspheres**
)
IT Drug delivery systems
(microspheres, controlled-release; controlled release of nifedipine from interpenetrating network poly(vinyl alc.)-guar gum **hydrogel microspheres**)

IT 21829-25-4, Nifedipine
(controlled release of nifedipine from interpenetrating network poly(vinyl alc.)-guar gum **hydrogel microspheres**
)
IT 9000-30-0, Guar gum 9002-89-5, Poly(vinyl alcohol)
(controlled release of nifedipine from interpenetrating network poly(vinyl alc.)-guar gum **hydrogel microspheres**
)
IT 111-30-8, Glutaraldehyde
(controlled release of nifedipine from interpenetrating network poly(vinyl alc.)-guar gum **hydrogel microspheres**
)

L42 ANSWER 10 OF 23 HCA COPYRIGHT 2006 ACS on STN
131:311135 Poly(N-isopropylacrylamide) **microgels** at the air-water interface. Zhang, Ju; Pelton, Robert (McMaster Centre for Pulp and Paper Research Department of Chemical Engineering, McMaster University, Hamilton, ON, L8S 4L7, Can.). Langmuir, 15(23), 8032-8036 (English) **1999.** CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.
AB The surface tension of colloidal methylenebisacrylamide-crosslinked poly(N-isopropylacrylamide) (PNIPAM) dispersions was measured as functions of surface age, temp., and the morphol. of the PNIPAM **microgels.** The **microgels** lowered the surface tension of water to about 43 mJ/m2 at 25 .degree.C and a little less at 40 .degree.C. The steady-state surface tension values were not very sensitive to temp. or to the degree of **microgel** crosslinking. On the other hand, the time required to reach a steady state was dependent upon **microgel** morphol. The lower the crosslinking or the lower the particle uniformity, the more rapid was the surface tension decline. **Microgels** were obsd. to form an ordered **array** at the air/water interface when viewed by an environmental **scanning electron** microscope. It was proposed that the rate of surface tension lowering was in part influenced by the rate of particle spreading after adsorption onto the interface.
CC 37-5 (Plastics Manufacture and Processing)
ST isopropylacrylamide polymer **microgel** surface tension
IT Adsorbed substances
Microgels
(crosslinked isopropylacrylamide polymer **microgels** adsorbed at air/water interface)
IT Polymer morphology
(of crosslinked isopropylacrylamide polymer **microgels** adsorbed at air/water interface)
IT 90398-43-9, N-Isopropylacrylamide-methylenebisacrylamide copolymer
(**microgels**; surface properties at air-water interface)

L42 ANSWER 11 OF 23 HCA COPYRIGHT 2006 ACS on STN
130:318478 Using Elastomeric Membranes as Dry Resists and for Dry Lift-Off. Jackman, Rebecca J.; Duffy, David C.; Cherniavskaya, Oksana; Whitesides, George M. (Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA). Langmuir, 15(8), 2973-2984 (English) **1999.** CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.
AB Elastomeric membranes that contained regular **arrays** of well-defined holes were formed by spin-coating a prepolymer onto a photolithog. defined master. These membranes were used as dry resists or as masks in dry lift-off to produce simple features .gtoreq.5 .mu.m on both planar and nonplanar surfaces. These procedures were dry because the membranes conformed and sealed reversibly to surfaces: no solvent was required either to deposit the membrane or to remove it from the substrate. A variety of materials, some of which would be difficult to **pattern** using conventional methods, were **patterned** using this technique. These materials included metals, sol-gels, **hydrogels**, biol. macromols., and organometallic mols. The membranes were used in sequential, dry-lift off steps to produce structures with greater complexity than those generated with a single membrane.
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT **Electron beams**
(micropatterns of gold fabricated by **electron-beam** evapn. using polydimethylsioloxane membrane as dry lithog. resists)

L42 ANSWER 12 OF 23 HCA COPYRIGHT 2006 ACS on STN
130:297858 Investigations on the state of solution of viscose. Schleicher, Harry; Borrmeister, Bodo (Fraunhofer Inst., Germany). Lenzinger Berichte, 78, 7-11 (English) **1998.** CODEN: LEBEAW. ISSN: 0024-0907. Publisher: Lenzing AG.
AB Anal. methods for detection of particles in viscose solns. (particle counting and clogging values for macro gel particles, turbidimetry and rheol. measurements for **micro gel** particles, and light scattering for chain aggregates) are reviewed. Effects of **electron beam** treatment and CS2 levels on filter and rheo values are shown, and the use of additives is considered. The impact of viscose particles on filament yarn prodn. is described.
CC 40-7 (Textiles and Fibers)

L42 ANSWER 13 OF 23 HCA COPYRIGHT 2006 ACS on STN
130:118688 Solid-state ion-selective electrode **arrays.** Lynch, Aogan; Diamond, Dermot; Lemoine, Patrick; McLaughlin, Jim; Leader, Matt (Biomedical Environmental Sensor Technology Center, Dublin City

University, Dublin, Ire.). Electroanalysis, 10(16), 1096-1100 (English) **1998.** CODEN: ELANEU. ISSN: 1040-0397. Publisher: Wiley-VCH Verlag GmbH.

AB Variable pressure SEM is demonstrated to be a powerful method for directly studying microstructures and swelling processes occurring during conditioning of PVC-membrane ion-selective electrodes contg. a salt-doped **hydrogel** layer between the PVC and the internal Ag/AgCl ref. electrode. Using an inhouse developed virtual instrument interface and a portable PC fitted with a PCMCIA data acquisition card, it is easy to adapt **arrays** manufd. for blood-gas anal. for other applications which involve the detn. of mixts. of inorg. ions. The simultaneous anal. of Na, K, and Cl- over concn. ranges assocd. with the diagnosis of cystic fibrosis (CF) in sweat is demonstrated as an example.

CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 9

IT Computer program
(for ion-selective membrane electrode **arrays** for simultaneous detn. of Na, K, and Cl- in blood-gas anal.)

IT Blood analysis
(ion-selective membrane electrode **arrays** for simultaneous detn. of Na, K, and Cl- in blood-gas anal.)

IT Ion-selective electrodes
Microstructure
Scanning electron microscopy
Sensors
Swelling, physical
Vapor pressure
(microstructure and swelling of ion-selective membrane electrode **arrays** studied by variable pressure SEM)

IT 7440-09-7, Potassium, analysis 7440-23-5, Sodium, analysis 16887-00-6, Chloride, analysis
(ion-selective membrane electrode **arrays** for simultaneous detn. of Na, K, and Cl- in blood-gas anal.)

L42 ANSWER 14 OF 23 HCA COPYRIGHT 2006 ACS on STN

129:148181 Detection of irradiation treatment of foods using DNA "comet assay". Khan, Hasan M.; Delincee, Henry (National Centre of Excellence in Physical Chemistry, University of Peshawar, Peshawar, 25120, Pak.). Radiation Physics and Chemistry, 52(1-6), 141-144 (English) **1998.** CODEN: RPCHDM. ISSN: 0969-806X. Publisher: Elsevier Science Ltd..

AB **Microgel** electrophoresis of single cells (DNA comet assay) was investigated to detect irradn. treatment of some food samples. These samples of fresh and frozen rainbow trout, red lentil, gram and sliced almonds were irradiated to 1 or 2 kGy using 10 MeV **electron beam** from a linear accelerator. Rainbow trout samples yielded good results with samples irradiated to 1 or 2

kGy showing fragmentation of DNA and, therefore, longer comets with no intact cells. Unirradiated samples showed shorter comets with a significant no. of intact cells. For rainbow trout stored in a freezer for 11 days the irradiated samples can still be discerned by electrophoresis from unirradiated samples, however, the unirradiated trouts also showed some longer comets besides some intact cells. Radiation treatment of red lentils can also be detected by this method, i.e. no intact cells in 1 or 2 kGy irradiated samples and shorter comets and some intact cells in unirradiated samples. However, the results for gram and sliced almond samples were not satisfactory since some intact DNA cells were obsd. in irradiated samples as well. Incomplete lysis may have led to these deviating results.

CC 17-1 (Food and Feed Chemistry)
Section cross-reference(s): 8

IT Almond (Prunus amygdalus)
Chickpea (Cicer arietinum)
Electron beams
Fish
Food analysis
Lentil
Oncorhynchus mykiss
(detection of irradn. treatment of foods by using DNA comet assay)

L42 ANSWER 15 OF 23 HCA COPYRIGHT 2006 ACS on STN
127:166639 Mechanism of drug release from silicone microspheres containing Polycarbophil. Carelli, V.; Di Colo, G.; Gesi, M.; Martini, F.; Nannipieri, E. (Department Pharmaceutical Sciences, University Pisa, Pisa, 56126, Italy). International Journal of Pharmaceutics, 153(1), 105-114 (English) **1997.** CODEN: IJPHDE. ISSN: 0378-5173. Publisher: Elsevier.

AB The possibility of a pH-controlled drug release mechanism applying to silicone microspheres contg. nicotinamide (NAM) and Polycarbophil (PCP), a pH-sensitive **hydrogel**, is evaluated. NAM-medicated PCP in the 4:1 PCP-NAM wt ratio was dispersed, at the 20% or 40% concn., in silicone in the form of osmotically active particles of around 15 .mu.m mean vol. diam., and encapsulated in microspheres in the 105-710 .mu.m size range by a modified emulsion vulcanization technique, with a 100% entrapment efficiency. The external and internal morphol. of microspheres, and the size distribution of PCP-NAM particles dispersed therein are evaluated by **scanning electron** microg. Microspheres were eluted 9 h with simulated GI fluids (pH 1.2-7.4). Assessment of the time exponent characterizing the release kinetics, together with release and swelling data from planar matrixes of some formulation as the microspheres, substantiate the following release mechanism. Due to their small size, the osmotically active particles have a

limited ability to crack the silicone polymer and interconnect upon swelling, so the **hydrogel** route of release is of a minor relevance, and so is the **hydrogel** pH-sensitivity. Drug release is mainly governed by partitioning-diffusion in the silicone continuum of microspheres, therefore it is pH-independent and the time exponent is close to the value typical of Fickian release. Encapsulation of **hydrogel** particles of larger size is a necessary condition for a pH-controlled release **pattern.**

CC 63-5 (Pharmaceuticals)

L42 ANSWER 16 OF 23 HCA COPYRIGHT 2006 ACS on STN

125:22326 Ink-jet recording sheet with receiving layer containing **electron-beam**-curable compounds. Yasui, Koichi; Mukoyoshi, Shunichiro (Shinoji Seishi Kk, Japan). Jpn. Kokai Tokkyo Koho JP 08058226 A2 **19960305** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-199231 19940824.

AB The recording sheet has a recording layer, which is obtained by coating of a support with an aq. compn. followed by **irradn** . with **electron-beam** and contains poly(vinylpyrrolidone) (I), **electron-beam** -curable compds., **e**.g. polyethylene glycol diglycidyl diacrylate, and minute particles of crosslinked polymers, e.g. those based on acrylate esters or styrene. Poly(vinyl alc.) may be addnl. contain in the recording layer. The ink-jet recording sheet show good ink absorbability and high water resistance, and images recorded thereon are clear.

IC ICM B41M005-00

CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT Printing, nonimpact
(ink-jet, ink-jet printing sheets with recording layer contg. poly(vinylpyrrolidone), **electron-beam**-curable compds., and crosslinked polymer powders with good ink absorbability and water resistance)

IT 9002-89-5, PVA 105 9003-39-8, Luviskol K 90 26570-48-9, Newfrontier PE 600 87719-53-7, Epoxyester 400EA 152287-40-6, **Microgel** E 5001 154999-77-6, **Microgel** E 1002 156228-80-7, **Microgel** E 5003 177570-95-5, BR 160 177571-00-5, Nippe **Microgel** E 1001
(ink-jet printing sheets with recording layer contg. poly(vinylpyrrolidone), **electron-beam**-curable compds., and crosslinked polymer powders with good ink absorbability and water resistance)

L42 ANSWER 17 OF 23 HCA COPYRIGHT 2006 ACS on STN

120:300676 Porous sheets and manufacture thereof. Matsubayashi, Katsuaki; Ikezawa, Hideo (Oji Paper Co, Japan). Jpn. Kokai Tokkyo Koho JP 05301309 A2 **19931116** Heisei, 6 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 1992-107774 19920427.

AB Porous sheets useful for heat insulators, cushions, packing materials, decorative materials, etc. comprise a support sheet, an **electron beam**-cured resin layer contg. hollow particles, and an **electron beam**-cured resin layer in that order. A cast-coated paper was coated to 40 g/m2 with a compn. from nonylphenoxyethyl acrylate 75, urethane acrylate oligomer (Beamset 551B) 25, and Expancel 551DE20 8 parts, **electron beam**-cured, and adhered to an **electron beam**-cured film from 70 parts hexaethylene glycol diacrylate and 30 parts urethane acrylate oligomer (UV7550B).

IC ICM B32B005-18
ICS B32B007-02; B32B027-16; B32B027-20; B32B031-28

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 42, 43

ST porous acrylic coating paper; urethane acrylate porous coating paper; hollow particle coating paper; **electron beam** cured coating paper

IT Paper
(porous **electron beam**-cured coatings for)

IT Coating materials
(**electron-beam**-curable, acrylic, contg. hollow particles, for paper)

IT 115925-86-5, Expancel 551DE20 147014-71-9, Nippe **Microgel** MBB 1000
(**electron beam**-cured acrylic coatings contg., porous, on paper)

L42 ANSWER 18 OF 23 HCA COPYRIGHT 2006 ACS on STN

119:97167 Ion-conductive polymer compositions. Takeda, Kazunari; Murata, Kazuo (Yuasa Koohoreeshon Kk, Japan). Jpn. Kokai Tokkyo Koho JP 05078590 A2 **19930330** Heisei, 6 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1991-273283 19910924.

AB The compns., useful for batteries, are composed of org. polymers contg. ionic compds., and finely powd. org. compds. Thus, a soln. contg. a 7:3 mixt. of ethylene oxide dimethacrylate (mol. wt. 4000) and polyethylene glycol monoacrylate (mol. wt. 400) 30, LiClO4 6, propylene carbonate 64, and **Microgel** P 5002 (av. particle size .ltoreq.1 .mu.m) 7 parts was cast on a glass plate and **irradiated** with **electron beam** to form a 100-.mu.m film showing ion cond. 1.7 .times. 10-3 S/cm at 25.degree., 7.0 .times. 10-4 at 0.degree., and 2.2 .times. 10-4 at -20.degree..

IC ICM C08L101-00
ICS C08K003-00; C08K005-00; H01M006-18

CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 52, 76

IT 9011-14-7, **Microgel** P 5002
(powd., ion-conductive films contg., for batteries)

L42 ANSWER 19 OF 23 HCA COPYRIGHT 2006 ACS on STN
118:180194 Thermal-transfer recording image-receiving sheets providing high quality image. Matsubayashi, Katsuaki; Ikezawa, Hideo (Oji Paper Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04275194 A2 **19920930** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-119589 19910301.
AB The title sheets are prepd. by forming an interlayer contg. a UV- or **electron beam**-curable resin and hollow particles and an image-receiving layer successively on a substrate. The sheets provide high quality images with high d. Thus, a paper support was coated with a compn. contg. Beam Set 550B-2-hydroxy-3-phenoxypropyl acrylate copolymer and Rohpaque OP 84J (hollow particle), **irradiated** with an **electron beam**, and overcoated with an image-receiving layer based on Vylon 200 (polyester resin) to give an image-receiving sheet.
IC ICM B41M005-40
CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT 93403-04-4D, Nonylphenoxyethyl acrylate, copolymer with urethane acrylate oligomer 122525-81-9, Ropaque OP 84J 143067-68-9, JSR-SX 863A 144328-11-0, Beam Set 550B-2-hydroxy-3-phenoxypropyl acrylate copolymer 146999-07-7 147014-71-9, Nippe **Microgel** MBB 1000
(thermal-transfer recording receptor interlayer contg.)

L42 ANSWER 20 OF 23 HCA COPYRIGHT 2006 ACS on STN
112:100868 Reactive **microgel** compositions for coatings. Tamura, Shinichi; Satake, Jun; Ide, Kazuhiko; Suzuki, Takehiro; Takenaka, Yoshiaki (Toyo Ink Mfg. Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 01234468 A2 **19890919** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-60930 19880315.
AB Radiation- and heat-curable title compns., giving coatings with excellent adhesion, hardness, solvent resistance, and antiblocking property, are manufd. by hydrolytic polycondensation of 100 parts mixts. contg. 1-100% alkoxysilanes having polymerizable double bond and 0-99% other alkoxysilanes and 1-400 parts silica sol. Thus, .gamma.-methacryloxypropyltrimethoxysilane (I) 70, .gamma.-glycidoxypropyltrimethoxysilane (II) 30, Snowtex O (20% solids) 500, isopropanol 200, and H2O 600 parts were mixed for 24 h to give a **microgel** compn., which was applied on a glass plate, dried 20 min at 80.degree., and **irradiated** by **electron beam** to give a coating showing no change after rubbing with a cloth contg. MEK 100 times, pencil hardness 5H, and cross-cut adhesion 25/25, vs., 1, 4B, and 0/25, resp., using MeSi(OMe)3 instead of I and II.

IC ICM C08L083-07
ICS C08K003-36; C08L083-06
CC 42-10 (Coatings, Inks, and Related Products)
ST acryloyloxypropylsilane **microgel** manuf; radiation curable coating unsatd silane; heat curable coating unsatd silane; silica sol **microgel** manuf
IT Coating materials
(blocking- and solvent-resistant, UV-curable, unsatd. siloxane **microgels** for, with good adhesion and hardness)
IT Coating materials
(blocking- and solvent-resistant, **electron-beam** -curable, unsatd. siloxane **microgels** for, with good adhesion and hardness)
IT Coating materials
(blocking- and solvent-resistant, heat-curable, unsatd. siloxane **microgels** for, with good adhesion and hardness)
IT Polymerization
(hydrolytic, of unsatd. alkoxysilanes and silica sol, in manuf. of reactive **microgels** for coatings)
IT **Gels**
(**micro**-, manuf. of, from unsatd. alkoxysilanes and silica sol, for coatings)
IT 7631-86-9, Colloidal silica, reactions
(colloidal, in hydrolytic polymn. of unsatd. alkoxysilanes, reactive **microgels** from, for coatings)
IT 2530-85-0 2768-02-7 4369-14-6
(hydrolytic polymn. of, in manuf. of reactive **microgels** for coatings)
IT 78-10-4, Tetraethoxysilane 1185-55-3, Methyltrimethoxysilane 2530-83-8, .gamma.-Glycidoxypropyltrimethoxysilane
(hydrolytic polymn. of, with unsatd. alkoxysilanes, in manuf. of reactive **microgels** for coatings)
IT 59112-39-9, Ludox AM
(in hydrolytic polymn. of unsatd. alkoxysilanes, reactive **microgels** from, for coatings)

L42 ANSWER 21 OF 23 HCA COPYRIGHT 2006 ACS on STN
105:98374 Behavior of heterogeneous macromolecular structures. Part I: **Microgels** and coated **microgels.** Kunz, D.; Burchard, W. (Inst. Macromol. Chem., Univ. Freiburg, Freiburg/Br, D-7800, Fed. Rep. Ger.). Colloid and Polymer Science, 264(6), 498-506 (English) **1986.** CODEN: CPMSB6. ISSN: 0303-402X.
AB The light scattering data of unmodified PMMA [9011-14-7] and polystyrene (I)-grafted PMMA **microgels** in various solvents were interpreted using a hard-core-with-dangling-chain **microgel** model which provided good correlation between the core radius and the radius of gyration. The deviations between the particle scattering factors of modified PMMA **microgels** and

those of hard spheres were attributed to the dangling I chains on the **microgels** and to the swelling of the PMMA core due to its incompatibility with I chains.

CC 36-7 (Physical Properties of Synthetic High Polymers)

ST PMMA polystyrene **microgel** light scattering; polymethacrylate polystyrene **microgel** light scattering; solvent effect PMMA light scattering; radius gyration PMMA polystyrene **microgel**; modeling PMMA polystyrene **microgel**; styrene grafted PMMA **microgel**

IT **Electron beam**, chemical and physical effects
(depolymn. by, of styrene-grafted PMMA **microgels**)

IT Light, chemical and physical effects
(in PMMA and styrene-grafted PMMA **microgel** study of solvent effect on hydrodynamic radius and radius of gyration, by scattering)

IT Radius of gyration
(of PMMA and styrene-grafted PMMA **microgels**, light scattering in relation to)

IT Depolymerization
(of styrene-grafted PMMA **microgels**, **electron beam irradn.** effect on)

IT Solvent effect
(on light scattering of PMMA and styrene-grafted PMMA **microgels**, hydrodynamic radius and radius of gyration in relation to)

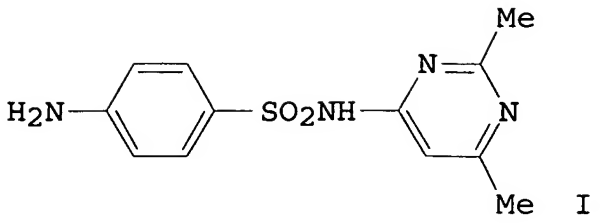
IT 25034-86-0
(graft, **microgels**, light scattering by, solvent effect on, hydrodynamic radius and radius of gyration in relation to)

IT 9011-14-7
(**microgels**, light scattering by, solvent effect on, hydrodynamic radius and radius of gyration in relation to)

L42 ANSWER 22 OF 23 HCA COPYRIGHT 2006 ACS on STN

87:206421 Some physicochemical characteristics of agglomerates and microcapsules of sulfisomidine spray-dried from aqueous slurries and ammonium solutions. Takenaka, Hideo; Kawashima, Yoshiaki; Ishibashi, Ryoichi (Gifu Coll. Pharm., Mitahora, Japan). Drug Development and Industrial Pharmacy, 3(5), 459-74 (English) **1977.** CODEN: DDIPD8. ISSN: 0363-9045.

GI



I

AB Aq. slurries or ammonium solns. of sulfisomidine (I) [515-64-0] contg. various kinds of binder, i.e. gum arabic, gelatin, CM-cellulose [9004-32-4], methyl cellulose [9004-67-5], or poly(vinylpyrrolidone) [9003-39-8] were spray dried using a centrifugal wheel atomizer. The spray dried products were found by **scanning electron** microscopy observation to be agglomerated or encapsulated. The products prepd. from the aq. slurries were microcapsules coated with a smooth film, while the products from ammonium solns. were agglomerates with porous agglomerating crusts on their surfaces. Micromeritic properties such as, particle diam., flow and packing properties, etc. were investigated. IR absorption spectra confirmed that the spray dried ammonium I was converted to the nonsalt form during drying. X-ray diffraction **patterns** were obtained to investigate the cryst. forms and to det. the degree of crystallinity of spray dried I. Solubilities of the products were measured in distilled water and the disintegration test solns. I and II at 37.degree. and were correlated with the degree of crystallinity of the spray dried I.

CC 63-5 (Pharmaceuticals)

IT Capsules
(**micro-**, **gelatin**, for sulfisomidine, physicochem. properties of)

L42 ANSWER 23 OF 23 HCA COPYRIGHT 2006 ACS on STN

65:29814 Original Reference No. 65:5545e-f Effect of .gamma.-radiation on polymers in solution. IX. A turbidimetric study of solutions of poly(vinyl alcohol) irradiated below the critical concentration for gel formation. Sakurada, Ichiro; Ikada, Yoshito (Univ. Kyoto, Japan). Bulletin of the Institute for Chemical Research, Kyoto University, 44(1), 66-73 (English) **1966.** CODEN: BICRAS. ISSN: 0023-6071.

AB The radius of **microgel** particles formed in the irradiation of dil. aq. solns. of poly(vinyl alc.) was estd. by turbidity measurements to be 500-2400 A. The radius decreased with increasing dose, indicating that intramol. cross-linking occurs upon irradiation. Particle sizes obtained by electron microscopy were 1/5 to 1/8th the size of those detd. by turbidity. It was concluded that turbidity is a measure of the radius of the actual gel

particles and that the electron micrograph is a measure of the radius of the primary particle which forms the gel particle.
CC 45 (Synthetic High Polymers)
IT Particles
(-size detn., of vinyl alc. polymers cross-linked by .gamma.-**irradiation**, by **electron** microscopy and turbidimetry)
IT 9002-89-5, Vinyl alcohol polymers
(particle size detn. of .gamma.-**irradiated**, by **electron** microscopy and turbidimetry)

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L43 ANSWER 1 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI A Novel Strategy for Encapsulation and Release of Proteins: Hydrogels and Microgels with Acid-Labile Acetal Cross-Linkers

L43 ANSWER 2 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI A hybrid polymer gel and its static non-ergodicity

L43 ANSWER 3 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Optical Properties of N-Isopropylacrylamide Microgel Spheres in Water

L43 ANSWER 4 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Preparation and property analysis of St/BVA/BA **polymer microgel** with core-shell structure

L43 ANSWER 5 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Synthesis of Discotic Microgels by Cross-Linking of Poly(styrene-block-4-vinylpyridine)/3-n-Pentadecylphenol Blend Film

L43 ANSWER 6 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Photolithographic synthesis of intelligent microgels

L43 ANSWER 7 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Synthesis of reactive **polymer microgel** with core-shell structure

L43 ANSWER 8 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Some amphiphilic polymers at interface and functional films

L43 ANSWER 9 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Microgel formation in high molecular weight poly(ethylene oxide)

L43 ANSWER 10 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Water-dispersed photopolymer microgels with core-shell structure

modified by glycidyl methacrylate

L43 ANSWER 11 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Precipitation polymerization of divinylbenzene: an investigation of the particle formation mechanism

L43 ANSWER 12 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI **Design**, synthesis and characterization of ion responsive microgels: effect of structure and composition on properties and performance

L43 ANSWER 13 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Polymer blend systems for water-borne paints

L43 ANSWER 14 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Nanogels and **microgels**: the new **polymeric** materials playground

L43 ANSWER 15 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI The role of precursor architecture in polymer network structure

L43 ANSWER 16 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Molecular **design** of reactive microgels

L43 ANSWER 17 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI **Microgel** formation in emulsion **copolymerization.** II. Seed polymerization

L43 ANSWER 18 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Study of the stabilization of pure lipases: comparison of two different lipase-microgel derivatives

L43 ANSWER 19 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Coatings containing microgels. II. Moisture vapor permeable coatings

L43 ANSWER 20 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Low profile BMC for making transparent simulated stone composite

L43 ANSWER 21 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI **Design** of microgel-containing coatings

L43 ANSWER 22 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Photopolymerizable composition containing microgel for photoresist

L43 ANSWER 23 OF 24 HCA COPYRIGHT 2006 ACS on STN
TI Microgel

L43 ANSWER 24 OF 24 HCA COPYRIGHT 2006 ACS on STN

TI Inorganic coordination polymers. XVIII. Brittle and flexible films of {Cr[OP(CH3)(C6H5)O]2[OP(C8H17)2O]}x

=> d l43 6,9,12,14,15,16,17,19,21,22,23 cbib abs hitstr hitind

L43 ANSWER 6 OF 24 HCA COPYRIGHT 2006 ACS on STN
134:238163 Photolithographic synthesis of intelligent microgels. Ito, Yoshihiro (Department of Biological Science and Technology, The University of Tokushima, Tokushima, 770-8506, Japan). Journal of Intelligent Material Systems and Structures, Volume Date 1999, 10(7), 541-547 (English) **2000.** CODEN: JMSSER. ISSN: 1045-389X. Publisher: Technomic Publishing Co., Inc..
AB Hydrogels having microscopic structures were synthesized by a photolithog. method. First a photoreactive pH- or thermosensitive polymer was synthesized by chem. coupling of poly(acrylic acid) and poly(N-isopropylacrylamide-co-acrylic acid) with azidoaniline. Subsequently, the polymer was coated on a polystyrene plate or a glass plate and the coated plate was photo-irradiated through photomasks having prescribed **patterns.** PH- or thermo-responsive microgels whose structures corresponded to the photomask **patterns** were constructed. They rapidly swelled and contracted by changing pH or temp. The pH- or temp.-induced structural change was reversible.
CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 35, 36, 38
ST photolithog synthesis intelligent **polymeric microgel**; azidoaniline contg acrylic acid isopropylacrylamide copolymer intelligent polymeric
IT Swelling, physical
(deswelling; photolithog. synthesis of intelligent **polymeric microgels** and their properties)
IT Hydrogels
Microgels
Photolithography
Photomasks (lithographic masks)
Smart materials
Turbidity
(photolithog. synthesis of intelligent **polymeric microgels** and their properties)
IT 14860-64-1DP, 4-Azidoaniline, reaction products with acrylic acid-isopropylacrylamide copolymer 79042-19-6DP, Acrylic acid-N-isopropylacrylamide copolymer, reaction products with 4-azidoaniline
(photolithog. synthesis of intelligent **polymeric microgels** and their properties)

L43 ANSWER 9 OF 24 HCA COPYRIGHT 2006 ACS on STN

133:5235 Microgel formation in high molecular weight poly(ethylene oxide). Rangelov, S.; Brown, W. (Department of Physical Chemistry, University of Uppsala, Uppsala, 751 21, Swed.). Polymer, 41(13), 4825-4830 (English) **2000.** CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB Light scattering measurements show that, below mol. wts. of about 106, PEO chains in aq. soln. follow the expected **pattern** of behavior for a flexible chain in a thermodynamically good solvent, although the coils are unusually extended because of specific interactions with water. For higher mol. wt. chains, the mol. wt. scaling exponent for the radius of gyration decreases and the parameter p = (Rg/Rh) consequently decreases. The obsd. collapse to a more compact coil conformation is because of microgel formation, probably stabilized by intramol. hydrogen bonding via solvent mols.

CC 36-7 (Physical Properties of Synthetic High Polymers)

IT **Polymer** chains
(conformation; **microgel** formation in high mol. wt. poly(ethylene oxide))

IT **Polymer** chains
(relaxation; **microgel** formation in high mol. wt. poly(ethylene oxide))

L43 ANSWER 12 OF 24 HCA COPYRIGHT 2006 ACS on STN

132:108623 **Design**, synthesis and characterization of ion responsive microgels: effect of structure and composition on properties and performance. Eichenbaum, Gary Marc (Duke Univ., Durham, NC, USA). 180 pp. Avail. UMI, Order No. DA9928820 From: Diss. Abstr. Int., B 1999, 60(5), 2294 (English) **1999.**

AB Unavailable

CC 36-7 (Physical Properties of Synthetic High Polymers)

ST **polymer microgel** structure compn property

L43 ANSWER 14 OF 24 HCA COPYRIGHT 2006 ACS on STN

129:290646 Nanogels and **microgels**: the new **polymeric** materials playground. Graham, Neil B.; Cameron, Audrey (Dep. Pure Appl. Chem., Univ. Strathclyde, Glasgow, UK). Pure and Applied Chemistry, 70(6), 1271-1275 (English) **1998.** CODEN: PACHAS. ISSN: 0033-4545. Publisher: Blackwell Science Ltd..

AB Microgels, or intramolecularly crosslinked macromols. (ICMs), have been known for a no. of years. They are formed during the polymn. of polyfunctional precursors en-route, but at incomplete reaction, to the macrogelation initially propounded by Carothers and Flory. These gelation theories did not predict that such microgels made in soln. could be prepd. from such polyfunctional reactive solns. at complete reaction and high concns., without gelation. Microgels have been successfully and usefully prepd., however, at complete conversion of their contained reactive groups by the use of either

aq. or non-aq. dispersion polymn. in which surface active agents are utilized to contain the polymn. to isolated submicron-size domains. The progression towards macrogelation is constrained to the max. size of the dispersed domains. This paper demonstrates the contrasting general observation that macrogelation in solvents of such polyfunctional reactive precursors cannot occur below a Crit. Gelation Concn. (CGC) if a carefully selected match of solvent soly. parameters for the polymn. solvent and the formed polymer is made. In some cases the addn. of only ca. ten percent wt./wt. of solvent is required to completely prevent macrogelation at complete conversion. In addn. polymn. the mol. wt. of the produced ICMs may be varied in a simple controllable manner from the low thousands (nanogels) to many millions (microgels) simply by the choice of concn. at which they are prepd. The products are a distinct form of polymer which is quite different to the linear analog and almost certainly these soln.-prepd. products are different to the microgels formed by aq. dispersion polymn. techniques. This new soln. technique provides a simple and general new method for the ready synthesis and **design** of an enormous range of bespoke globular polymers having both fundamental academic interest and potential com. utility.

CC 36-7 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 35

ST intramolecularly crosslinked **polymeric microgel** nanogel

IT **Microgels**
(characteristics of **polymeric** nanogels and **microgels**)

IT Polymers, properties
(characteristics of **polymeric** nanogels and **microgels**)

IT Gels
(nano-; characteristics of **polymeric** nanogels and **microgels**)

IT 26298-55-5, Diethylene glycol dimethacrylate-2-Hydroxyethyl methacrylate copolymer 27308-26-5, Diethylene glycol dimethacrylatemethyl methacrylate copolymer
(characteristics of **polymeric** nanogels and **microgels**)

L43 ANSWER 15 OF 24 HCA COPYRIGHT 2006 ACS on STN

127:162299 The role of precursor architecture in polymer network structure. Dusek, Karel (Acad. of Sci. of the Czech Republic, Inst. of Macromol. Chem., Prague, 162 06, Czech.). Trends in Polymer Science (Cambridge, United Kingdom), 5(8), 268-274 (English) **1997.** CODEN: TPSCE8. ISSN: 0966-4793. Publisher: Elsevier.

AB A review with 42 refs. The structure and properties of polymer

networks prepd. from simple precursors can be varied by changing the initial compn. of the system from which networks with more (or less) dangling chains that have more (or less) time-dependent phys. properties can be **designed.** The formation in situ of 'hard' chem. clusters in multicomponent networks is another way of influencing network structure. Precursors of special architectures include telechelic polymers functional star, comb or ladder functional **polymers**, **microgels**, and dendritic and hyperbranched polymers. The **design** of the precursor controls the viscosity build-up during crosslinking and the final properties. Changes in precursor architecture also affect the crosslinking kinetics (or the dependence of the apparent reactivity of functional groups on their placement in the precursor mol., making the 'rate consts.' conversion-dependent), onset of gelation, the development of the gel fraction and the degree of crosslinking in the gel. The effect of newer architectures on various material properties is still largely unknown. A combination of covalent architectures with special phys. interactions between the precursors that may lead to self-organization of subarchitectures in a network appears to be promising.

CC 36-0 (Physical Properties of Synthetic High Polymers)

L43 ANSWER 16 OF 24 HCA COPYRIGHT 2006 ACS on STN

125:222618 Molecular **design** of reactive microgels. Kaczun, J.; Funke, W. (II. Institut Technische Chemie, Universitaet Stuttgart, Stuttgart, D-70569, Germany). Angewandte Makromolekulare Chemie, 240, 99-112 (English) **1996.** CODEN: ANMCBO. ISSN: 0003-3146. Publisher: Huethig & Wepf.

AB Structure and properties of **microgels** prepd. by emulsion **copolymn.** depend on compn. and concn. of the monomers at the reaction sites, reactivity ratios, and soly. of the comonomers in water. By sep. and joint solubilization of 1,4-divinylbenzene and various acrylic comonomers of different soly. it could be shown, that the diffusion control of the copolymn. rate is favored by crosslinking, by a high concn. of an oil-sol. initiator and of the emulsifier, and by a low soly. of the comonomer in water.

CC 35-4 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36

ST divinylbenzene acrylic monomer emulsion **polymn** **microgel**

IT Gels
(micro-, structure and properties of reactive **microgels** prepd. by emulsion **polymn.** of divinylbenzene with acrylic monomers)

IT 9003-63-8P, Butyl methacrylate homopolymer 25768-50-7P, Cyclohexyl methacrylate homopolymer 25989-95-1P, 1,4-Divinylbenzene homopolymer 27496-64-6P, Methyl methacrylate-1,4-divinylbenzene copolymer 63087-30-9P, Ethyl acrylate-1,4-divinylbenzene copolymer

106127-85-9P, Methyl acrylate-1,4-divinylbenzene copolymer
122098-04-8P, Acrylamide-1,4-divinylbenzene copolymer
181702-23-8P, Cyclohexyl methacrylate-1,4-diethenylbenzene copolymer
181702-24-9P, Butyl methacrylate-1,4-divinylbenzene copolymer
(structure and properties of reactive **microgels** prepd. by emulsion **polymn.** of divinylbenzene with acrylic monomers)

L43 ANSWER 17 OF 24 HCA COPYRIGHT 2006 ACS on STN
124:344245 **Microgel** formation in emulsion **copolymerization.** II. Seed polymerization. Tobita, Hidetaka; Yoshihara, Yasunori (Dep. Materials Science Eng., Fukui Univ., Fukui, 910, Japan). Journal of Polymer Science, Part B: Polymer Physics, 34(8), 1415-1422 (English) **1996.** CODEN: JPBPEM. ISSN: 0887-6266. Publisher: Wiley.

AB Microgel formation in seeded emulsion copolymn. of Me methacrylate and ethylene glycol dimethacrylate is investigated both exptl. and theor. By introducing seed latex, the network structure development can be changed significantly. Even when the crosslinking d. development takes a similar **pattern** as in homogeneous media, the mol. wt. development shows both types of behavior of emulsion polymn. without seed latex and homogeneous polymn., depending on the primary polymer chain length and the mole fraction of the divinyl monomer used. Once the microgels are formed, the wt.-av. mol. wt. increases just linearly with conversion due to a very small locus of polymn. The present investigation reveals important characteristics of gelation phenomena in a limited space.

CC 35-4 (Chemistry of Synthetic High Polymers)

ST methacrylate seed emulsion **copolymn microgel** formation

IT **Polymerization**
(emulsion, seed, **microgel** formation in seed emulsion copolymn.)

IT 25777-71-3P, Methyl methacrylate-ethylene glycol dimethacrylate **copolymer**
(**microgel** formation in seed emulsion copolymn.)

L43 ANSWER 19 OF 24 HCA COPYRIGHT 2006 ACS on STN
118:171053 Coatings containing microgels. II. Moisture vapor permeable coatings. Yagi, T.; Saito, K.; Ishikura, S. (Trade Use Paint Div., Nippon Paint Co. Ltd., Neyagawa, 572, Japan). Progress in Organic Coatings, 21(1), 25-35 (English) **1992.** CODEN: POGCAT. ISSN: 0033-0655.

AB Elastic breather paints, permeable to moisture vapor, were formulated with acrylic latex polymers with low glass transition temps. using ethylene glycol dimethacrylate-styrene **copolymer microgels** produced via an emulsion polymn. process. These microgels were **designed** to have a

hydrophilic sheath surrounding a crosslinked acrylic core. The moisture vapor transmission rates of the films were measured and showed a 10-fold increase when the microgel was included in the formulation, with no sacrifice of either the water resistance or the CO2 barrier performance. Low-mol.-wt. surfactants were tried as an alternative to the microgels, but failed to attain the improved permeation performance. TEM observation demonstrated that the microgels segregated within the interfacial space between the coalescing latex particles, forming a fine percolating texture. The mechanism for moisture vapor permeation through the films which contained microgels was discussed.

CC 42-10 (Coatings, Inks, and Related Products)

ST acrylic latex coating contg microgel; moisture permeation coating microgel; ethylene glycol dimethacrylate **copolymer microgel**; styrene **copolymer microgel** coating

IT Particle size
Polymer morphology
(of acrylic latex coatings contg. styrene **copolymer microgels**, moisture permeability in relation to)

IT Permeability and Permeation
(of moisture, to acrylic latex coatings contg. styrene **copolymer microgels**)

IT Coating materials
(latex, acrylic, contg. styrene **copolymer microgels**, moisture-permeable)

IT 124-38-9, Carbon dioxide, properties
(barrier performance to, of acrylic latex coatings contg. styrene **copolymer microgels**)

IT 28377-44-8, 2-Ethylhexyl acrylate-methacrylic acidmethyl methacrylate-styrene copolymer
(coatings, contg. ethylene glycol dimethacrylate-styrene **copolymer microgels**, moisture-permeable)

IT 26376-90-9, Ethylene glycol dimethacrylate-styrene **copolymer** (**microgels**, acrylic latex coatings contg., moisture-permeable)

L43 ANSWER 21 OF 24 HCA COPYRIGHT 2006 ACS on STN

112:58258 **Design** of microgel-containing coatings. Muramoto, H.; Ishii, K.; Miyazono, T.; Ishikura, S.; Mizuguchi, R. (Tech. Cent., Nippon Paint Co. Ltd., Osaka, Japan). Advances in Organic Coatings Science and Technology Series, 11, 57-61 (English) **1989.** CODEN: AOCSDV. ISSN: 0271-1885.

AB Microgels were prepd. by emulsion copolymn. of Bu acrylate, Me methacrylate, and styrene using ethylene glycol dimethacrylate as crosslinking agent. Coatings contg. the microgels showed excellent sagging properties and film appearance. The swelling ratio of the microgels in org. media could be varied over a wide range by

changing the degree of crosslinking. The viscosity of microgel dispersions depended on the particle sizes of the microgels, which could be controlled by swelling. The surface structure of the microgels was modified through the formationof a shell layer, which consisted of grafted linear polymers around the core particle. Transparent clear films could be attained by using these core-shell microgels instead of core microgels only, without any other modification of the core particles.

CC 42-7 (Coatings, Inks, and Related Products)

ST acrylic **polymer microgel** coating; emulsion **polymn** acrylic **microgel**

IT Coating materials
(acrylic **polymer microgel**-contg., with good sagging properties and film appearance)

IT Crosslinking
(of acrylic **polymer microgels**, coatings properties in relation to)

IT 9003-08-1, Formaldehyde-melamine copolymer
(coatings contg. acrylic **polymer microgels** and, with good sagging properties and film appearance)

L43 ANSWER 22 OF 24 HCA COPYRIGHT 2006 ACS on STN

109:14764 Photopolymerizable composition containing microgel for photoresist. Fryd, Michael; Suess, Terry Roland (du Pont de Nemours, E. I., and Co., USA). Eur. Pat. Appl. EP 230936 A2 **19870805**, 17 pp. DESIGNATED STATES: R: BE, CH, DE, FR, GB, IT, LI, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1987-100568 19870117. PRIORITY: US 1986-821330 19860122.

AB A photopolymerizable compn. which is preferably used as a photoresist is comprised of an addn. polymerizable ethylenically unsatd. monomer, a photoinitiator, a **polymer** binder, and a **microgel** in which the **polymer** binder and the **microgel** form a single phase and having glass transition temps. differing by .ltoreq.50.degree., with the microgel having a glass transition temp. >25.degree.. The introduction of the microgel to the photopolymerizable compn. increases its photospeed. Thus, a microgel was prepd. from Me methacrylate, Et acrylate, methacrylic acid, and butanediol diacrylate. A compn. comprised of Me methacrylate-Et acrylate-methacrylic acid **copolymer**, the **microgel** prepd. above, polyethylene oxide, ethoxylated trimethylolpropane triacrylate, itaconic acid, maleic acid, urethane diacrylate, Et p-dimethylaminobenzoate, Micheler's ketone, benzophenone, 4-methyl-4-trichloromethylcyclohexadienone, leuco crystal violet, diethylhydroxylamine, victoria blue, victoria blue, MeOH, and CH2Cl2 was coated on a support, dried to give a photoresist layer, laminated on a Cu surface, exposed to a Hg lamp, and developed in an aq. CaCO3 soln. to give a resist **pattern** with a good photospeed.

IC ICM G03C001-68
ICS G03F007-02
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT Resists
(photo-, contg. addn. polymerizable ethylenically unsatd. monomer and **polymer** bind and **microgel** and photoinitiator with improved photospeed)
IT 97-65-4, Itaconic acid, uses and miscellaneous 110-16-7, Maleic acid, uses and miscellaneous 3274-12-2 25322-68-3, Polyethylene oxide
(photoresists contg. addn. polymerizable ethylenically unsatd. monomer and **polymer** binder and **microgel** and photoinitiator and, with improved photospeed)
IT 90-94-8, Michler's ketone 119-61-9, Benzophenone, uses and miscellaneous 10287-53-3, Ethyl-p-dimethylaminobenzoate
(photoresists contg. addn. polymerizable ethylenically unsatd. monomer and **polymer** binder and **microgel** and, with improved photospeed)
IT 3524-68-3, Pentaerythritol triacrylate 15625-89-5D, Trimethylolpropane triacrylate, ethoxylated
(photoresists contg. **polymer** binder and **microgel** and photoinitiator and, with improved photospeed)

L43 ANSWER 23 OF 24 HCA COPYRIGHT 2006 ACS on STN
102:63701 Microgel. Olson, Kurt Gordon; Das, Suryya Kumar; Dowbenko, Rostyslaw (PPG Industries, Inc. , USA). Eur. Pat. Appl. EP 123939 A2 **19841107**, 24 pp. DESIGNATED STATES: R: AT, BE, DE, FR, GB, IT. (English). CODEN: EPXXDW. APPLICATION: EP 1984-103588 19840331. PRIORITY: US 1983-482117 19830404.
AB **Polymeric microgels**, which are useful for coatings with improved sag resistance and metallic pigment **pattern** control, are manufd. by polymg. a mixt. of ethylenically unsatd. monomers which contain a 1,2-epoxy group-contg. ethylenically unsatd. monomer via aq. emulsion polymn. in the presence of an acid. The emulsion can be inverted into org. diluent, and the water removed to form a dispersion of the microgel in the org. diluent. Thus, a kettle charge contg. deionized water 3624.3, Aerosol OT (I) 25.8, Triton N101 (II) 75.2, and p-toluenesulfonic acid [104-15-4] 12.4 g was heated in a N atm. to 85.degree., then a mixt. contg. Me methacrylate 1406.7, styrene 560.5, glycidyl methacrylate 382.1, Bu acrylate 558.1, 1-dodecanethiol 14.9, water 1251.7, I 6.4, and II 76.3 g was added to the reaction vessel, followed by addn. of 15.5 g (NH4)2S208 in 375.6 g water and a mixt. contg. 2-sulfoethyl methacrylate [10595-80-9] 21.0, water 629.9, I 25.2, and II 25.1 g. The reaction was conducted 4 h at 83-84.degree.. The crosslinked copolymer

emulsion [37953-21-2] contained discrete microgel particles of av. particle size 970 .ANG., which were insol. in Me amyl ketone. The obtained aq. emulsion was inverted with org. solvent and water was removed by azeotropic distn. A powd. Al-contg. paste contg. the above microgel, when sprayed on preprimed panels and baked 20 min at 265.degree., gave a coating with good sag resistance and Al pigment **pattern** control (gloss and flop).

IC C08F002-22; C08F020-32; C09D003-74

CC 42-7 (Coatings, Inks, and Related Products)
Section cross-reference(s): 35

ST acrylic **polymer microgel** coating; toluenesulfonic acid crosslinking catalyst; sulfoethyl methacrylate crosslinking polymn; glycidyl methacrylate copolymer coating; sulfonic acid crosslinking catalyst; crosslinking acrylic **polymer microgel**

IT 10595-80-9
(catalysts, for **microgel** formation, in emulsion **copolymn.** of epoxy group-contg. vinyl monomers)